Kapilow 1999-0096D

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**Patent Application**

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| Inventor(s) | David A. Kapilow | Case Name | Kapilow 1999-0096D |
| Filing Date | 4/19/2000 | Serial No. | 09/700,429 |
| Examiner | V. Paul Harper | Group Art Unit | 2654 |
| Title | Method and Apparatus for Performing Packet Loss or Frame Erasure Concealment | | |

COMMISSIONER FOR PATENTS
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SIR:

AMENDMENT

REMARKS

This is in response to an Office action dated September 20, 2004.

Claim 1 is provisionally rejected under the judicially created doctrine of obvious-type double patenting as being unpatentable over claims 1 and 12 of copending application No. 09/700,524 in view of Stenger et al, "A New Error Concealment Technique for Audio Transmission with Packet Loss". Applicant respectfully traverses.

First, a provisional rejection may be applied based on an earlier filed, copending, unpublished application. MPEP 706.02(f)(2). Since the '524 copending application was filed on the same day as the instant application, it is not an **earlier** filed application and, therefore, it is not subject to a provisional rejection in view of the '524 application.

Additionally, it is respectfully submitted that the rejection is at least premature. Even without addressing the merits of the Examiner's assertion as to obviousness:

(a) it is not known whether the '524 application will issue, and if it does not, its publication date postdates the filing date of this application,

(b) Even if the '524 application issues, it is not known whether the Examiner will even wish to assert obviousness, or is asserted, whether the Examiner is correct in such an assertion, and

(c) it is not known which application will issue first.

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Claim 1 was rejected under 35 USC 103 as being unpatentable over Chen, US Patent 5,615,298 in view of Stenger et al, "A New Error Concealment Technique for Audio Transmission with Packet Loss" and further in view of Perkins et al "A survey of Packet Loss Recovery Techniques for Streaming Audio," IEEE Network, Sep/Oct 1998.

Claim 1 specifies the following three steps:

> (a) synthesizing a speech signal corresponding to an unavailable packet;
> (b) determining an overlap-add window to use in combining a portion of the synthesized speech signal with a subsequent speech signal resulting from a received packet being decoded by the receiver, wherein the size of the overlap-add window is determined based on the duration of the unavailability of packets; and
> (c) performing an overlap-add operation on the portion of the synthesized speech signal and such speech signal with use of the overlap-add window,

and the Examiner asserts that the Chen reference teaches step (a) of claim 1. The Examiner then asserts that the Stenger et al reference teaches an error concealment technique that

> includes the steps of determining the size of the gap (Figure 1, $d_{lost}$ §3; and §4, simulations run for single and double packet loss) ... and performing an overlap add operation to fill the gap (Figure 1, §1 INTRODUCTION).

Presumably, that is an assertion that Stenger et al teach steps (b) and (c) of the claim. Lastly, the Examiner asserts that the Perkins reference demonstrates that modifying the Chen reference in accord with the teachings of Stenger et al is appropriate because "it is well known in the art at the time of invention that this approach [the Stenger et al approach] works better than either waveform substitution or pitch waveform replication."

Applicant respectfully disagrees with the Examiner's assertion relative to the Stenger et al reference.

First, strictly speaking, the reference does not teach determining the size of the gap. What the reference describes is a technique for determining – for a given $d_{lost}$ – a search interval for beginning a speech stretching interval where segments prior to $d_{lost}$ are stretched so as to over the missing $d_{lost}$ interval. The entirety of the discussion in §3 of the reference deals with the $d_{lost}$ of an assumed single lost packet, and §4 mentions an

experiment that "simulated single packet loss by suppressing one packet within five and double packet loss by suppressing two packet within seven."

Second, the entire thrust of the Stenger et al reference is one where missing packets are NOT synthesized. Rather, as is very clear in FIG. 1, and also mentioned above, a number of packets that arrived prior to the gap are stretched to fill the gap. The important notion to keep in mind is that successfully received packets are converted to speech and the speech is stretched. In contradistinction, the first step of claim 1 specifies *synthesizing a speech signal corresponding to an unavailable packet*. That means that what is synthesized pertains to the unavailable packet or packets and it is that which is synthesized that is used instead of the unavailable decoded speech. With this in mind, it is clear that the stretched segments of Stenger et al are NOT synthesized segments because they don't pertain to the unavailable packet or packets. They are simply time-stretched versions of validly received and decoded packets. Put another way, they replace the signal of validly decoded speech, and nothing is placed instead of the unavailable packets.

Third, there is no determination of an overlap-add window to use in combining (a) a portion of the synthesized speech signal with (b) a subsequent speech signal resulting from a received packet being decoded by the receiver. As applicant views it, Stenger el al have no *synthesized* speech in the first place. Even if the Examiner were to assert that the time-stretched segments are synthesized speech, applicant's argument still holds because then the situation would be one where synthesized segments are overlap added among themselves rather than an overlap addition of type (a) signal with type (b)signals.

Fourth, the Stenger et al reference stretches a number of segments that precede the missing packet. The *number* of segments that are selected for stretching is chosen to minimize various dilatory effects, and §3 discusses those, but that number is NOT taught to be a function of the number of missing packets. In the case of a single missing packet, for example, FIG. 1 of Stenger et al shows the speech of *three* previous packets being stretched. On the other hand, the second sentence of §3.3 Stanger et al states that stretching of speech from *two* previous packets is appropriate. Why at one point three packets are used and in another point two packets are used is not discussed. Also, no teaching is presented relative to the number of packets whose speech is stretched when

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more than one packet is missing. In short, the taught relationship of stretched speech segments relates to notions if tinny-ness and the like and not to the duration of the gap due to lost packet or packets.

Fifth, the Stenger et al reference stretches a number of segments that precede the missing packet. In contradistinction, the claim specifies "determining an overlap-add window to use in combining a portion of the synthesized speech signal with a subsequent speech signal resulting from a received packet being decoded by the receiver."

it is respectfully submitted that per force of each of the above reasons the claim defines subject matter that is different from that which is taught by Stenger et al, and their combination clearly dictates the conclusion that claim 1 is not obvious in light of the Chen arrangement that incorporates the teachings of Stenger et al as suggested by Perkins. Reconsideration and allowance of claim 1 are, therefore, respectfully solicited.

Respectfully,
David A. Kapilow

Dated: 12/8/04

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